

REMARKS

Entry of the foregoing, re-examination and reconsideration of the application identified in caption, as amended, pursuant to and consistent with 37 C.F.R. §1.111 and in light of the remarks which follow, are respectfully requested.

By the above amendments, new claim 21 has been added which recites that "the intermediate layers comprise an internal intermediate layer formed from the composition forming the internal layer, and an external intermediate layer formed from the composition forming the external layer". Support for new claim 21 can be found in the instant specification at least at page 6, lines 14-24. Claim 8 has been amended to depend from claim 21, and to replace "layers" with "layer". Claims 10 and 11 have been amended to delete the phrase "and/or the external intermediate layers". Claim 12 has been amended to delete the phrase "and/or the internal intermediate layers". New claims 22-24 are directed to subject matter deleted from claims 10-12, respectively, and depend from claim 21.

New claim 25 is directed to a structure wherein the at least one internal layer is adjacently arranged with the at least one external layer. Support for new claim 25 can be found in the specification at least at page 3, lines 21-24. New claim 26 is directed to a structure wherein the stress cracking resistance of the structure measured in a ZnCl₂ solution according to international standard SAE J 844 is greater than 500 hours. Support for new claim 26 can be found in the specification at least from page 14, line 5 to page 15, line 9, taken in connection with Tables I-V.

In the Official Action, claims 8 and 10-12 stand rejected under 35 U.S.C. §112, second paragraph, for the reasons set forth at pages 2 and 3 of the Official Action. In this regard, claim 8 has been amended to depend from claim 21, which provides antecedent basis for the recited

terms "the internal intermediate layer" and "the external intermediate layer". Also, the terms "internal intermediate layers" and "external intermediate layers" have been deleted from claims 10-12. For at least these reasons, withdrawal of this rejection is respectfully requested.

In the art rejections, claims 1-8, 9-12 and 14-20 stand rejected under 35 U.S.C. §103(a) as being obvious over U.S. Patent No. 5,219,003 (*Kerschbaumer*) in view of European patent document No. 0 646 627 (EP '627). Claim 13 stands rejected under 35 U.S.C. §103(a) as being obvious over *Kerschbaumer* in view of EP '627, and further in view of U.S. Patent No. 5,357,030 (*VanBuskirk et al.*). Withdrawal of these rejections is respectfully requested for at least the following reasons.

Kerschbaumer does not disclose or suggest each feature of the presently claimed invention. For example, the multilayer structure according to claim 1 comprises at least one external layer formed from a composition comprising as a polymer matrix a polyamide composition comprising:

(i) a polyamide thermoplastic copolymer obtained by copolymerization of ϵ -caprolactam with at least one of the monomers comprising:

- an amino acid comprising at least 9 carbon atoms, or a corresponding lactam, or
- a mixture of hexamethylenediamine with a diacid comprising at least 9 carbon atoms, the ratio by weight between the ϵ -caprolactam and the total amount of hexamethylenediamine and diacid and/or the amino acid being between 4 and 9, or

(ii) a mixture of at least the thermoplastic polyamide copolymer (i) and at least one second thermoplastic polyamide or copolyamide obtained by polymerization of monomers

comprising fewer than 9 carbon atoms, the content by weight of the second polymer or copolymer in the polymer matrix being between 0 and 80% by weight.

By comparison, *Kerschbaumer* has no disclosure or suggestion of an external layer formed from the composition recited in claim 1. The Official Action at pages 3 and 4 alleges that *Kerschbaumer* discloses at Table 1 a layered structure having an outer layer that consists of Grilon CA6E and Grilamid XE 3148.¹ Applicants respectfully disagree with this assertion. It is the middle layer of the Example 2 layered structure which contains 50% Grilon CA6E and 50% Grilamid ELY20NZ. In this regard, Table 1 includes a bracket around "Grilon CA6E 50%" and "Grilamid ELY20NZ 50%", and an arrow pointing from such bracket to "0.20 mm middle". Clearly, the middle layer, not the external layer, of the Example 2 layered structure includes 50% Grilon CA6E and 50% Grilamid ELY20NZ.

Moreover, Table 1 discloses that the external layer of the Example 2 layered structure contains Grilamid XE 3148. In this regard, *Kerschbaumer* discloses that Grilamid XE 3148 is "an impact resistance-modified PA 12" (*Kerschbaumer* at col. 3, line 32). That is, the Grilamid XE 3148 is not the same as or suggestive of the recited composition used to form the external layer.

In further contrast to the allegation that *Kerschbaumer* discloses an outer layer consisting of Grilon CA6E, it is noted that *Kerschbaumer* at column 2, lines 28-31, discloses the following:

... the multi-layered fuel lines of the invention have an external layer consisting of impact resistance-modified types of polyamide which can contain plasticizer [emphasis added] ...

¹*Kerschbaumer* discloses that Grilon CA6E is "an amorphous copolyamide based on caprolactam/laurolactam".

Referring to the list of polyamides set forth at column 3 of *Kerschbaumer*, Grilon CA6E is not an "impact resistance-modified type of polyamide". Simply put, there is no disclosure or suggestion of an external layer formed from Grilon CA6E, nor any composition for forming an external layer as recited in claim 1.

The Official Action at page 3 also alleges that the outer layer and the barrier layer disclosed by *Kerschbaumer* are "identical". However, *Kerschbaumer* discloses that "the multi-layered fuel lines of the invention have an external layer consisting of impact resistance-modified types of polyamide which can contain plasticizer, and of a middle barrier layer consisting of a polyamide substantially free of impact resistance modifiers" (*Kerschbaumer* at col. 2, lines 28-33) (emphasis added). Clearly, an "impact resistance-modified type of polyamide" and a "polyamide substantially free of impact resistance modifiers" are not identical. Further, none of the exemplary layered structures set forth in Table 1 include identical compositions used to form the middle and external layers. Rather, Example 1 contains a Grilon T300GM middle layer and a Grilon XE 3139 external layer; Example 2 contains a middle layer of 50% Grilon CA6E and 50% Grilamid ELY20NZ, and a Grilamid XE 3148 external layer; and the "comparison example" includes an EVAL F middle layer and a Grilon XE 3139 external layer. Accordingly, *Kerschbaumer* has no disclosure or suggestion of a layered structure with identical middle and outer layers, as alleged in the Official Action.

Furthermore, *Kerschbaumer* discloses employing the polyamide substantially free of impact resistance modifiers to form the middle barrier layer in order to increase the cold impact resistance of the multi-layered fuel line (*Kerschbaumer* at col. 2, lines 4-7 and 31-33). On the other hand, *Kerschbaumer* discloses using an impact resistant external layer to increase the

impact resistance of the fuel line (*Kerschbaumer* at col. 2, lines 7-9 and 28-30). In light of the completely different purposes of the compositions used to form the middle barrier layer and the external layer of *Kerschbaumer*, one of ordinary skill in the art would not have been motivated to modify the *Kerschbaumer* fuel line by employing a material for forming the middle barrier layer, i.e., Grilon CA6E, to form the external layer thereof.

EP '627 fails to cure the above-described deficiencies of *Kerschbaumer*. In this regard, the Examiner relies on EP '627 for disclosing an acid-modified ultra low density polyethylene which is used as an impact modifier of polyamide 6 (Official Action at page 4). However, like *Kerschbaumer*, EP '627 does not disclose or suggest a multilayer structure comprising at least one external layer formed from the composition recited in claim 1. In fact, EP '627 does not even relate to a multilayered structure, and merely discloses the use of the compositions thereof in the manufacture of "moulded and/or extruded pieces" (EP '627 at cols. 3 and 4).

VanBuskirk et al also fails to cure the above-described deficiencies of *Kerschbaumer*. *VanBuskirk et al* has been relied upon for disclosing "the addition of a chain extender to polyamide 6 for the purpose of improving the physical characteristics of the polyamide 6 in the making of extruded products" (Official Action at page 6). However, like *Kerschbaumer*, *VanBuskirk et al* fails to disclose or suggest a multilayer structure comprising at least one external layer formed from the composition recited in claim 1.

For at least the above reasons, the applied documents fail to render *prima facie* obvious one aspect of the present invention as defined by claim 1.

Additional aspects defined by the dependent claims further distinguish the present invention over the applied art. For example, new claim 25 is directed to a multilayer structure

wherein the at least one internal layer is adjacently arranged with the at least one external layer. The applied art fails to disclose or suggest such a feature. By comparison, *Kerschbaumer* discloses a multi-layered fuel line which contains a middle barrier layer positioned between an external layer and an internal layer. Moreover, one of ordinary skill in the art would not have been motivated to remove the middle barrier layer from the *Kerschbaumer* fuel line, because *Kerschbaumer* employs such middle barrier layer to increase the cold impact resistance of the fuel line.

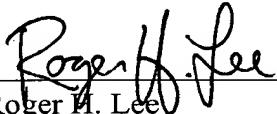
In addition, new claim 26 is directed to a structure wherein the stress cracking resistance of the structure measured in a $ZnCl_2$ solution according to international standard SAE J 844 is greater than 500 hours. The applied art fails to disclose or suggest such a feature. Referring to the attached copy of *Journal of Materials Science*, vol. 22 (1987), pp. 1707-14, nylon 6 and nylon 6,6 (which are similar to the polyamides disclosed by *Kerschbaumer*) are susceptible to stress cracking in aqueous salt solutions, in contrast with the advantageous stress cracking characteristics of the inventive structure set forth in claim 26. Moreover, *Kerschbaumer* has no mention of stress cracking properties in a $ZnCl_2$ solution, and merely mentions a fuel line which resists cold impact, has a satisfactory permeation resistance, does not delaminate, is stable in length, and has a brief overload capacity (*Kerschbaumer* at col. 1, lines 54-59). Simply put, there is no disclosure or suggestion of stress cracking resistance measured in a $ZnCl_2$ solution, let alone a resistance of greater than 500 hours as presently recited in claim 26.

For at least the reasons set forth above, withdrawal of the §103(a) rejections is respectfully requested.

From the foregoing, further and favorable action in the form of a Notice of Allowance is believed to be next in order, and such action is earnestly solicited. If there are any questions concerning this paper or the application in general, the Examiner is invited to telephone the undersigned.

Respectfully submitted,

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Marked-up claims 8 and 10-12

8. (Three Times Amended) Structure according to claim 21, [5,] wherein the internal intermediate layer [layers] and the external intermediate layer [layers] are arranged alternately in the transverse direction of the structure.

10. (Three Times Amended) Structure according to claim 1, wherein the composition forming the external layer [and/or the external intermediate layers] comprises a first 6/6-36 thermoplastic copolyamide and a second PA 6 thermoplastic polyamide.

11. (Three Times Amended) Structure according to claim 1, wherein the composition forming the external layer [and/or the external intermediate layers] comprises an impact modifier, optionally comprising functional groups which can react with the polyamide or polyamides.

12. (Three Times Amended) Structure according to claim 1, wherein the composition forming the internal layer [and/or the internal intermediate layers] has a modulus of less than 1500 MPa.